SAMSUNG

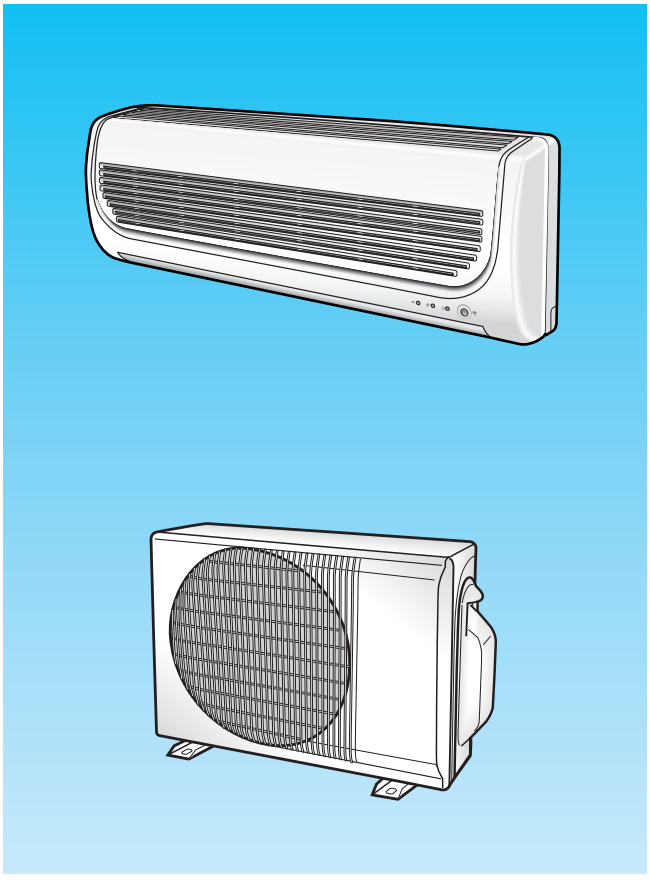
ROOM AIR CONDITIONER

INDOOR UNIT
SH07AWH

OUTDOOR UNIT
SH07AWHX

SERVICE *Manual*

AIR CONDITIONER



CONTENTS

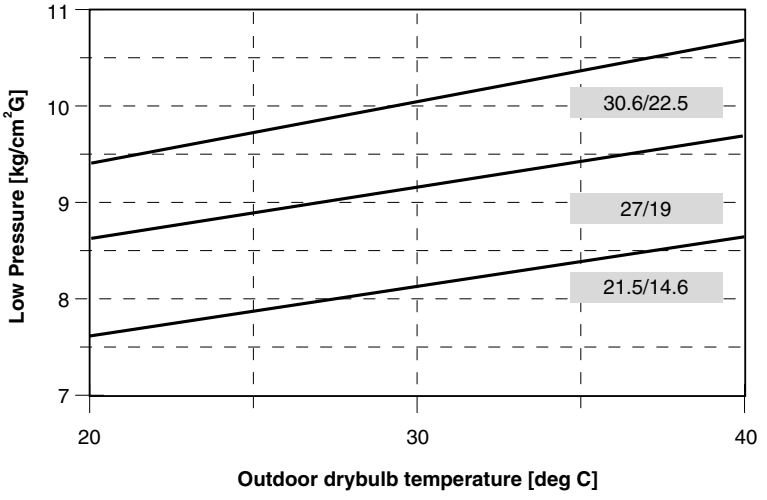
1. Product Specifications
2. Operating Instructions & Installation
3. Disassembly and Reassembly
4. Refrigerating Cycle Diagram
5. Set Up the Model Option
6. Troubleshooting
7. Exploded Views and Parts List
8. Block Diagram
9. Wiring Diagram

1. Product Specifications

1-1 Table

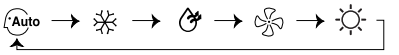
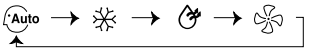
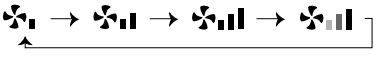
Item \ Model					SH07AWH	
					Indoor unit	Outdoor unit
Type					Wall-mounted	
Performance	Cooling			kW	2.25	
	Heating			kW	2.35	
	Dehumidifying			ℓ/h	1.0	
	Air Volume	Cooling		m^3/min	5.3	19
		Heating			5.8	19
	Noise	Cooling		dB	37	49
		Heating			37	49
	Energy Efficiency Ratio	Cooling		W/W	2.81	
		Heating			3.22	
	Power			ø-V-Hz	1-220/240-50	
Power	Power Consumption	Cooling		W	800	
		Heating			730	
	Operating Current	Cooling		A	3.6	
		Heating			3.3	
	Power Factor	Cooling		%	96.6	
		Heating			96.2	
	Starting Current			A	17	
	Power Cord	Length		m	-	
		Number of Core Wire			-	
		Capacity		A	250V-10 / 16A	
Size	Outer Dimension	Width x Height x Depth		mm	728x255x155	660x470x240
				inch	28.6x10.0x6.1	26.0x18.5x9.5
	Weight(Net)			kg	7.0	25.5
	Refrigerant Pipe	Liquid		mm x L(m)	ø6.35 x 7.5	
		Gas		mm x L(m)	ø9.52 x 7.5	
	Drain Hose			D x L(mm)	ø18 x 2,000	
	Compressor	Type			Rotary	
		Motor	Type		Induction Motor(PSC)	
			Rated Output			
	Oil Type				FREOL A 68ES-T, POLYOL ESTER	
	Blower	Type			Cross-flow	Propeller
		Motor	Type		steel	steel
			Rated Output	W	11	20
Heat Exchanger					2ROW 10STEP	1ROW 20STEP
Refrigerant Control Unit					CAPILLARY TUBE	
Freezer Oil Capacity				cc	280	
Refrigerant to Change(R410A)				g	490	
Protection Device(OLP)					RBC12126-12500	
Cooling Test Condition					INDOOR UNIT : DB27˚C WB19˚C OUTDOOR UNIT : DB35˚C WB24˚C	
Maximum Operation Condition					INDOOR UNIT : DB32˚C WB23˚C OUTDOOR UNIT : DB43˚C WB26˚C	

1-2 Pressure Graph



2. Operating Instructions & Installation

2-1 The Feature of Key in remote control

No	BUTTON	FUNCTION
1		On/Off & Timer Set/Cancel button. Press the button to stop and run the air conditioner or set up On/Off timer.
2		Mode selection button. Each time you press this button, Mode is changed in the following order. ▶ **In case of Heat pump model**  ▶ **In case of Cooling only model**  : Auto Mode : Fan Mode : Cool Mode : Heat Mode : Dry Mode
3	(UP)	Temperature adjustment button(UP). To increase the temperature by the pressing the temperature button.
	(DOWN)	Temperature adjustment button(DOWN). To decrease the temperature by the pressing the temperature button.
4		Turbo/Sleep mode selection button. Press the button one or more times until TURBO appears. The air conditioner cools or heats the room as quickly as possible. After 30minutes, the air conditioner is reset automatically to the previous mode.
		Turbo/Sleep mode selection button. Press the button one or more times until appears. The sleep timer can be used when you are cooling or heating your room to switch the air conditioner off automatically after a period of six hours.
5		Fan speed adjustment button. Each time you press this button, FAN SPEED is changed in the following order. 
6		Swing button. It adjusts the airflow to upward and downward.
7		On Timer button. The On Timer enables you to **switch on** the air conditioner automatically after a given period of time that is from 30 minutes to 24 hours. To cancel, press the (Set/Cancel) button.
8		Off Timer button. The Off Timer enables you to **switch off** the air conditioner automatically after a given period of time that is from 30 minutes to 24 hours. To cancel, press the (Set/Cancel) button.
9		Energy Saving button. If you wish to save energy when using your air conditioner, select the Energy saving mode with the button.

2-2 Details for Operation Property

1. AUTO MODE : In this mode, operation mode(COOL, HEAT) is selected automatically by the room temperature of initial operation.

   ▶ In case of Heat pump model.

Room Temp	Operation Type
Tr ≥ 21°C+ΔT	Cool Operation (Set Temp:24˚C+ΔT)
21°C+ΔT>Tr	Heat Operation (Set Temp:22˚C+ΔT)

   ▶ In case of Cooling only model.

Operation Type	Room Temp.	
Cool Operation	Tr ≥ 25°C+ΔT	Compressor ON
	Tr ≥ 24°C+ΔT	Compressor OFF

   ΔT= -1°C, -2°C, 0°C, +1°C, +2°C
   ΔT is controlled by setting temperature up/down key of remote control

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. HEAT MODE(In case of Heat pump model) :
   The unit operates according to the difference between the setting and room temperature.(16°C~30°C)
   *Prevention against cold wind : In order to prevent the cool air from flowing out at the heat mode, the indoor fan does not operate or operates very slowly in the following cases. At this time, the indoor heat exchanger will be preheating.
   - For 3~5 minutes after the initial operation
   - For deicing operation
   - The operation of an indoor fan in accordance with the temperature of an indoor heat exchanger

The temperature of indoor heat exchanger	Indoor fan speed
below 28˚C	off
28˚C~below 34˚C	LL Speed
34˚C~below 40˚C	L Speed
above 40˚C	Setting Speed

   *High temperature release function : It is a function to detect an outdoor overload by the sensor of an indoor heat exchanger and to turn the outdoor fan or the compressor ON/OFF for safety.
   *Deice : Deicing operation is controlled by indoor unit's heat exchanger temperature and accumulating time of compressor's operation.
   Deice ends by sensing of the processing time by deice condition.

4. DRY MODE : Has 3 states, each determined by room temperature.
   The unit operates in DRY mode.
   *Compressor ON/OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).
   *Protective function : Low temperature release. (Prevention against freeze)

5. TURBO MODE : This mode is available in AUTO, COOL, HEAT, DRY, FAN MODE.
   When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the setting temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

6. SLEEP MODE : Sleep mode is available only in COOL or HEAT mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.
   *In HEAT mode : The setting temperature is automatically dropped by 1°C each 1hour.
   When the temperature has been dropped by total of 2°C, that temperature is maintained.

7. FAN SPEED : Manual (3 step), Auto (4 step)
   Fan speed automatically varies depending on both the difference between setting and the room temperature.

8. COMPULSORY OPERATION :
   For operating the air conditioner without the remote control.
   *The operating is the same function that AUTO MODE in the remote control.

9. SWING : BLADE-H is rotated vertically by the stepping motor.
   *Swing Set : Press the button under the remote control is displayed on LCD the and the blades move up and down. If the one more time press the button, blades location is stop.

10. SETTING THE ON/OFF TIMER. :
    *ON TIMER : The On Timer enables you to switch on the air conditioner automatically after a given period of time. You can set the period of time from 30 minutes to 24 hours.
    *OFF TIMER : The Off Timer enables you to switch off the air conditioner automatically after a given period of time. You can set the period of time from 30 minutes to 24 hours.

11. BUZZER SOUND : Whenever the On/Off button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep".

2-3 Installation

2-3-1 Before Installation

Keep the air conditioner drain hose outlet and inlet free from its surroundings.
In case of breakdown, keep the symmetry and fix it to prevent vibration.
The pipe length shall meet the standard as far as possible.

2-3-2 Installation Procedure

■ Location

Install the product in an area to guarantee the best cooling effect, convenience of piping and electric work, and inexistence of vibration or wind in the vicinity.

■ Wall Drilling

Drill the wall downward in a diameter of 60 to 65mm.

■ Fixing Indoor Unit & Outdoor Unit

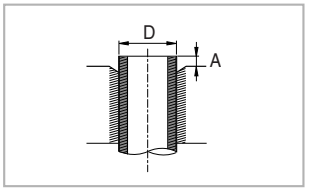
Fix the air conditioner hard enough so that it can not fall to the ground. On the roadside, the outdoor unit shall be installed 2m above ground and kept away from pedestrians to prevent direct exposure to hot wind.

■ Pipe Spooling & Connecting

You shall cut the pipe straightly with a pipe cutter and grind all the burrs of the cut surface.
Pipe expansion may continue until the pipe surface becomes uneven or torn apart.
Be sure to use a torque wrench to tighten pipes or flare nuts.

<Torque & Depth>

Outer Diameter(D)	Torque(kgf·cm)	Depth(A)
6.35mm(1/4")	140~170	1.3mm
12.70mm(1/2")	380~420	2.0mm
15.88mm(5/8")	440~480	2.2mm



■ Leak Test

Put an inert gas like nitrogen in the outdoor unit pipe and put soap bubbles or other test liquids on the pipe surface for the leak test.

■ Drain Hose Connecting

Install the drain hose downward to drain water naturally. Be sure to pour water into the hose to check if it drains well.

■ Electric & Earth Work

Electric and earth work shall meet the "Electric Facility Technology Standard" and the "Internal Wire Regulation" of the Electric Business Laws.

■ Inspection & Trial Run

Upon completion of the tests, you shall make a trial run while you explain the main functions of the air conditioner to finish the installation.

2-4 Installation Diagram of Indoor Unit and Outdoor Unit

2-4-1 Air-Purge Procedure

1) Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare nut.

2) Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service port (3/8" Packed valve) as shown at the figure.

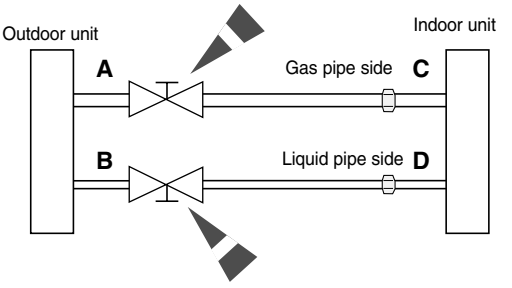
3) Open the valve of the low pressure side of manifold gauge counter-clockwise.

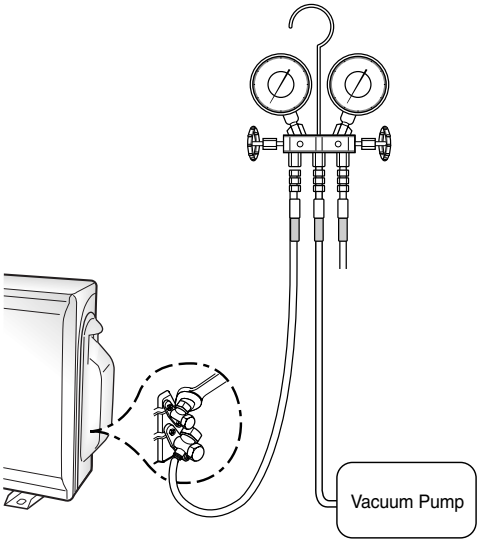
4) Purge the air from the system using vacuum pump for about 30 minutes.
   - After that, please recheck that pressure is stabilization.
   - Close the valve of the low pressure side of manifold gauge clockwise.
   - Remove the hose of the low pressure side of manifold gauge.

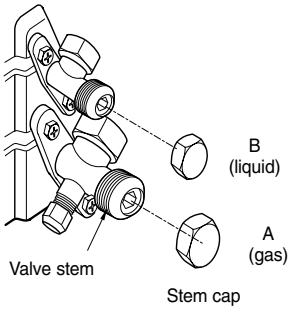
5) Set valve cork of both liquid side and gas side of packed valve to the open position.

6) Mount the valve stem nuts to the 2-Way and 3-Way valve. And mount the service port cap to 3-Way valve.

7) Check for gas leakage.
   - At this time, especially check for gas leakage from the 3-Way valve's stem nuts, and from the service port cap.







2-4-2 Refrigerant Refill(R410A)

Refill an air conditioner with refrigerant when refrigerant has been leaked at installing or using.

1) Purge air(for new installation only).

2) Turn the 3-Way valve clockwise to close, connect the pressure gauge (low pressure side) to the service valve, and open the 3-Way valve again.

3) Connect the tank to refill with refrigerant.

4) Set the unit to cool operation mode.

5) Check the pressure indicated by the pressure gauge(low pressure side).

   *** Standard pressure is should be 9.0~10.0kg/cm² in a regular, high operation mode.**

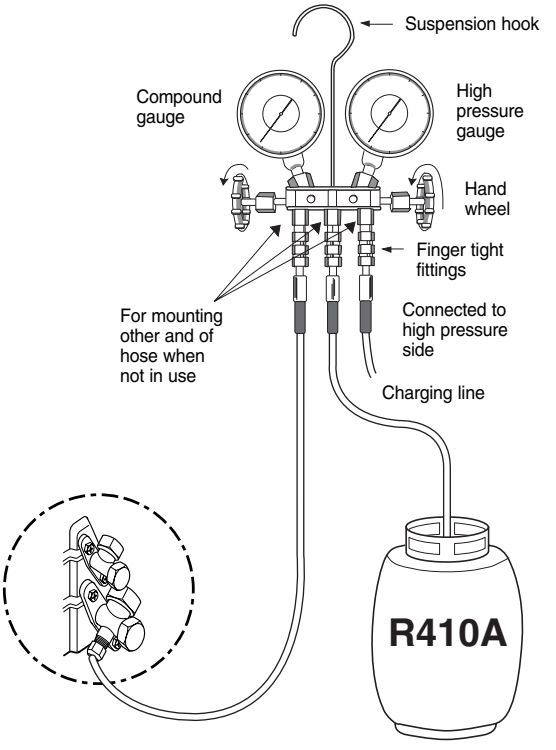
6) Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.

   *** It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.**

7) Stop operation of the air conditioner.

8) Close the 3-Way valve, disconnect the pressure gauge, and open the 3-Way valve again.

9) Close the cap of each valve.



2-4-3 "Pump down" Procedure

Pump down will be carried out when an evaporator is replaced or when the unit is relocated in another area.

1) Remove the caps from the 2-Way valve and the 3-Way valve.

2) Turn the 3-Way valve clockwise to close and connect a pressure gauge (low pressure side) to the service valve, and open the 3-Way valve again.

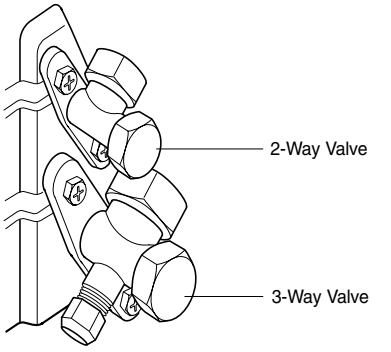
3) Set the unit to cool operation mode. (Check if the compressor is operating.)

4) Turn the 2-Way valve clockwise to close.

5) When the pressure gauge indicates "0" turn the 3-Way valve clockwise to close.

6) Stop operation of the air conditioner.

7) Close the cap of each valve.



Remarks

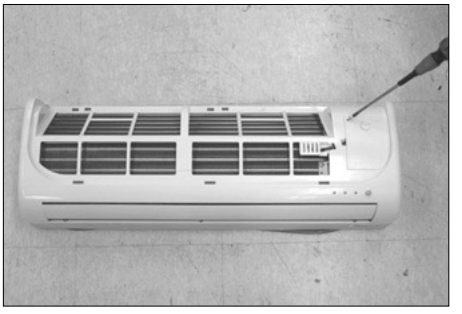
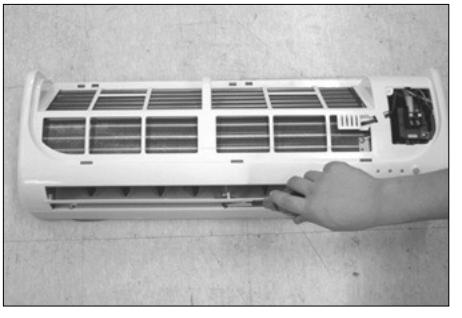
Relocation of the air conditioner

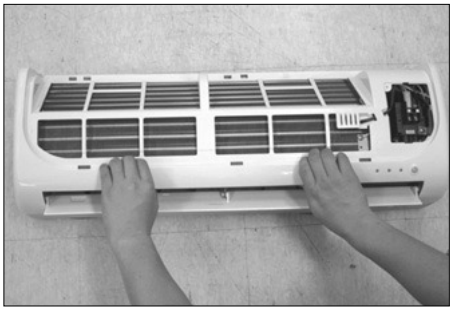
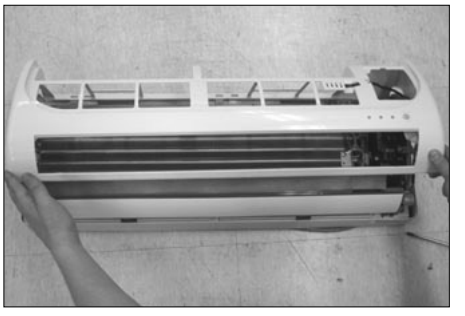
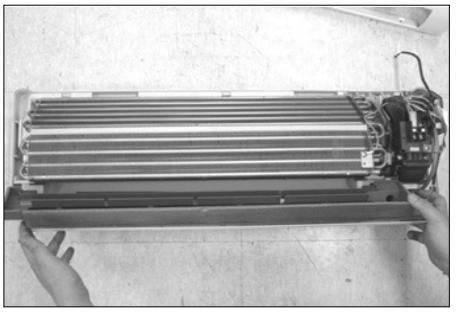
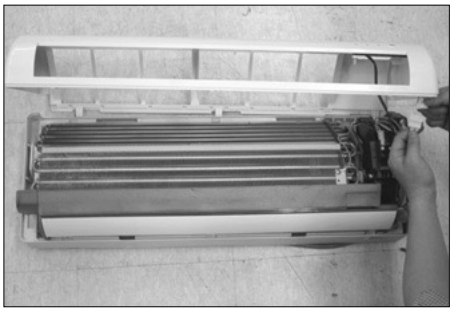
- Refer to this procedure when the unit is relocated.
- Carry out the pump down procedure (refer to the details of 'pump down').
- Remove the power cord.
- Disconnect the assembly cable from the indoor and outdoor units.
- Remove the flare nut connecting the indoor unit and the pipe.
- At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Disconnect the pipe connected to the outdoor unit.
  At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Make sure you do not bend the connection pipes in the middle and store together with the cables.
- Move the indoor and outdoor units to a new location.
- Remove the mounting plate for the indoor unit and move it to a new location.

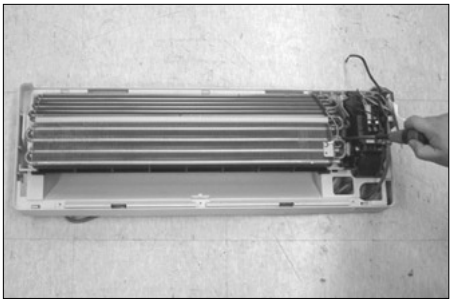
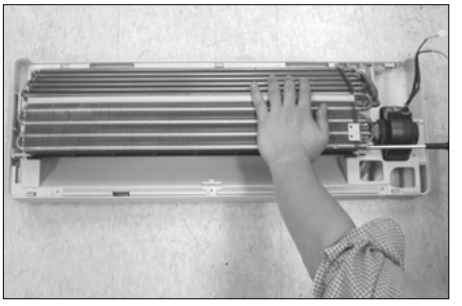
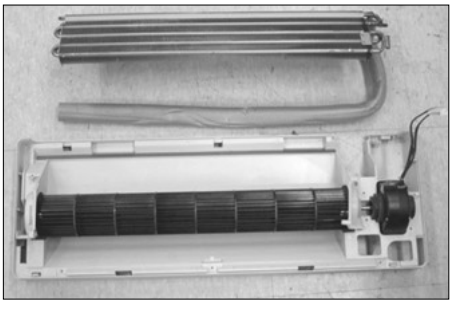
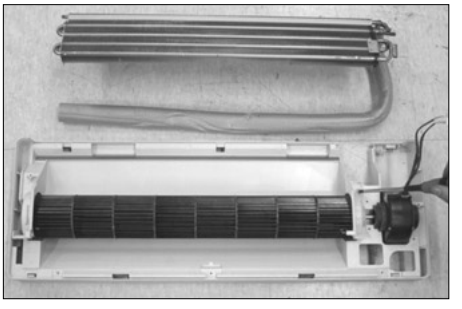
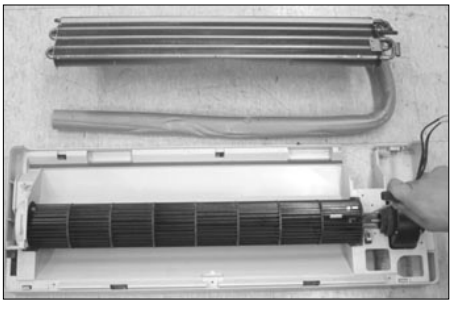
3. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

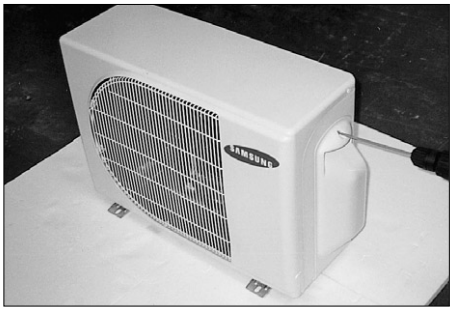
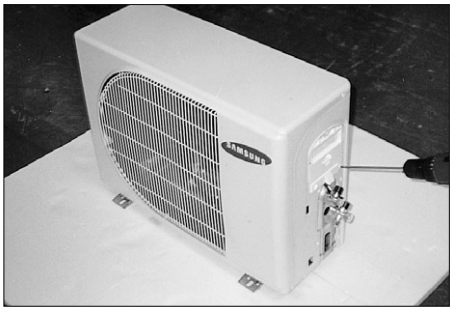
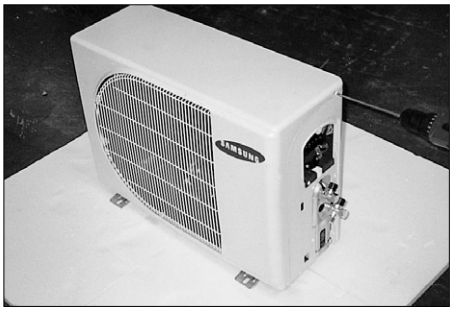
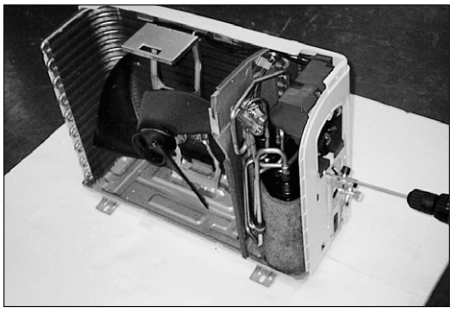
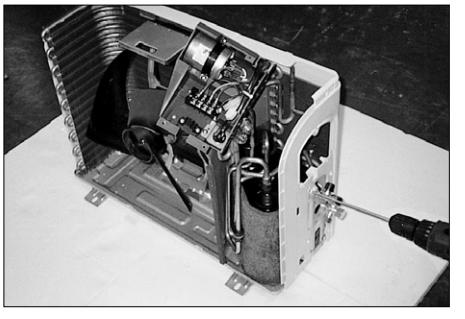
3-1 Indoor Unit

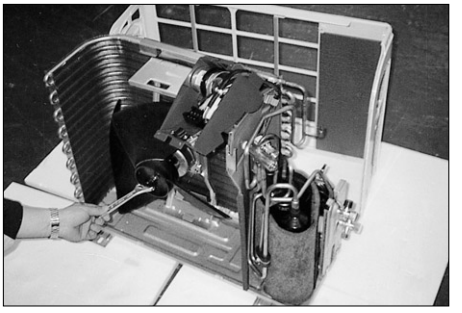
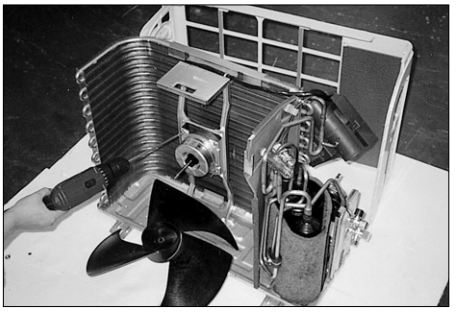
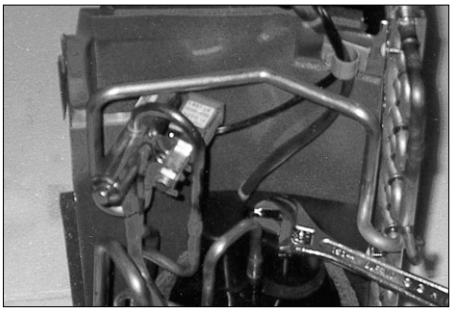
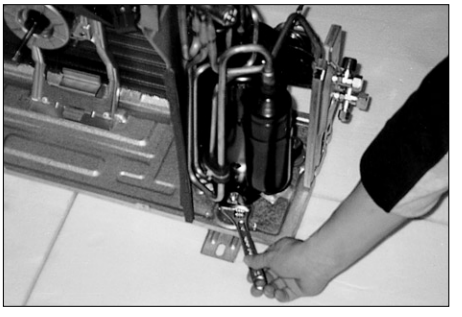
No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Detach tape of Grille Air-Inlet.	
		3) After Both End Part of the Grille Lower Position are pressing, it shall be detach by pushing up.	
		4) Loosen 1 of the right screw and detach the Terminal Cover. 5) Detach the thermistor from the Front Grille.	
		6) Loosen 3 fixing screws of Front Panel.	

No	Parts	Procedure	Remark
		7) Pull the lower left and right of discharge softly for the outside cover to be pulled out.	
		8) In order to disassemble the Panel Front press, in order, the left, center and right of the upper side of the Panel Grille with the plam of the hand to remove the hook. And then disassemble the Panel Grille.	
2	Tray Drain	1) Pull Tray Drain out from the Back Body.	
3	Electrical Parts (Main PCB)	1) Take all the connector of PCB upper side out. (Inclusion Power Cord) 2) Detach the outdoor unit connection wire from the Terminal Block. 3) If pulling the main PCB up, it will be taken out.	

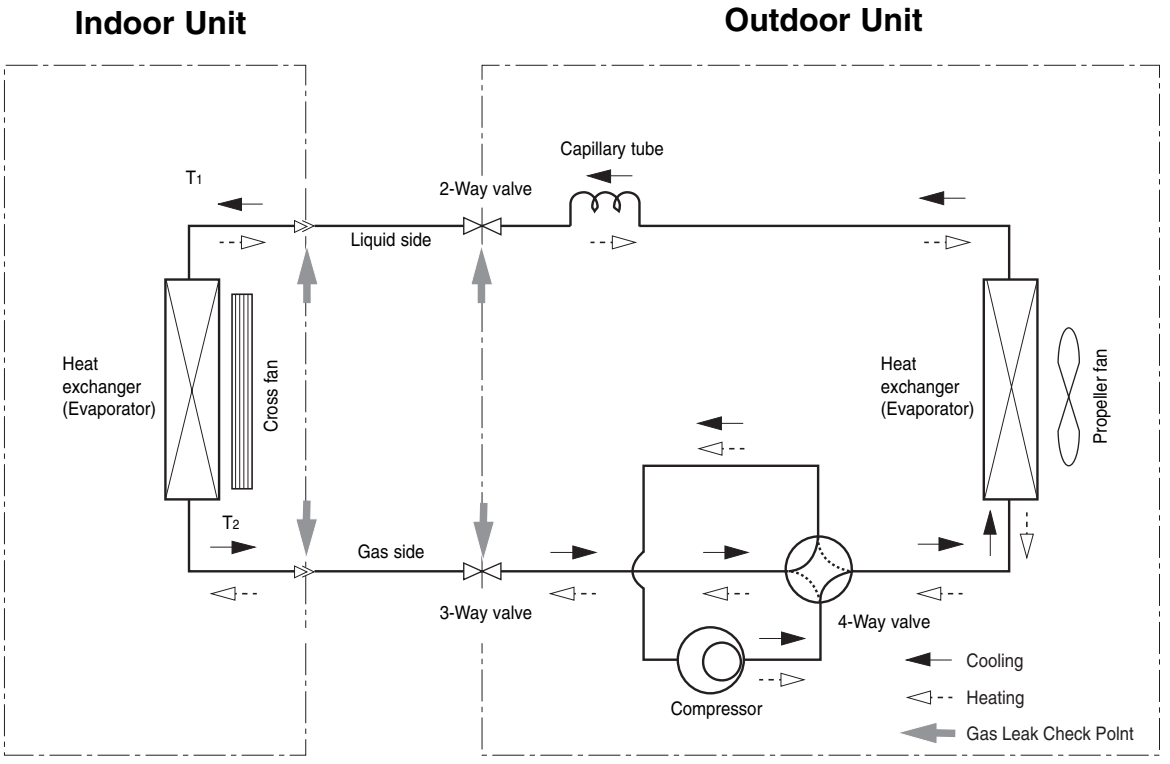
No	Parts	Procedure	Remark
4	Heat Exchanger	1) Loosen 2 fixing earth screws of right side. 2) Detach the Connection Pipe. 3) Detach the Holder Pipe at the rear side. 4) Loosen the 2 fixing screws of right and left side. 5) Lifting the Heat Exchanger up a little to push the up side for separation from the indoor unit.	  
5	Fan Motor & Cross Fan	1) Loosen the 4 fixing screws and detach the Motor Holder. 2) Loosen the fixing screw of Fan Motor. (with a M3 wrench) 3) Detach the Fan Motor from the Fan. 4) Detach the Fan from the left Holder Bearing.	 

3-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Common Work	1) Loosen 2 fixing screws and detach the Cover Terminal.	
		2) Loosen 2 fixing screws and detach the Cover Control. 3) Detach the connection wire from the Terminal Block.	
		4) Loosen 6 fixing screws and detach the Cabinet-Front.	
		5) Loosen 1 fixing screw of Ass'y E-part.	
		6) Loosen 12 fixing screws and detach the Cabinet-Side.	

No	Parts	Procedure	Remark
2	Fan & Motor	1) Remove the Nut Flange. (Turn to the clockwise) 2) Detach the Fan.	
		3) Loosen 4 fixing screws to detach the Motor. 4) Loosen 2 fixing screws and detach the Motor Bracket from the Base.	
3	Heat Exchanger	1) Loosen 2 fixing screws of left and right side. 2) Disassemble the inlet and outlet pipe by welding. 3) Detach the Heat Exchanger.	
4	Compressor	1) Open the Terminal Cover of Compressor and unscrew the Connection Terminal. 2) Disassemble the inlet and outlet pipe of Compressor by Welding. 3) Loosen 3 bolts of the lower part. 4) Detach the Compressor.	 

4. Refrigerating Cycle Diagram



5. Set Up the Model Option

5-1 Setting Option Setup Method

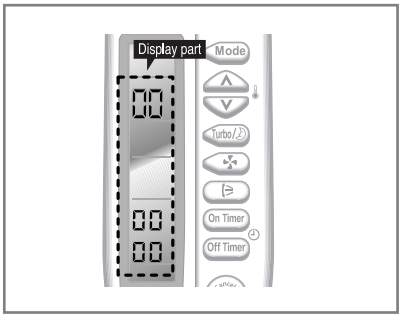
Option No. : 005024- 170360

Step 1 : **Enter the Option Setup mode.**

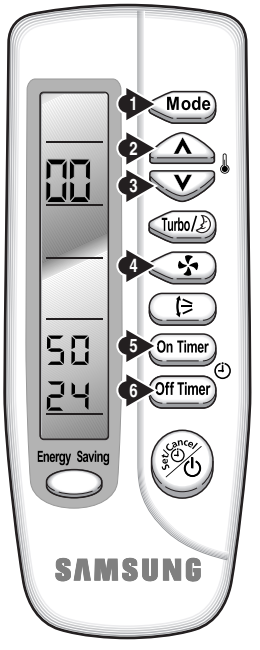
1st Take out the batteries of remote control.

2nd Press the temperature button simultaneously and insert the battery again.

3rd Make sure the remocon display shown as 00 00 00 .



Step 2 : **Enter the Option Setup mode and select your option according to the following procedure.**



✳ Setting is not required if you must 0 a value which has a 0 default.

1

The default value is 00 00 00 .
Otherwise, push the Mode button to 0 .
Every time you push the button, the display panel reads 1 or 0 repeatedly.

2

Push the button to set the display panel to 0 .
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ ··· 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

3

Push the button to set the display panel to 5 .
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ ··· 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

4

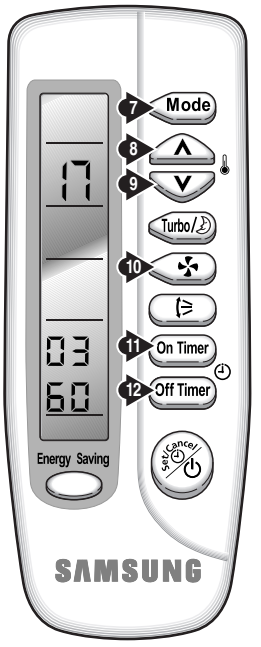
Push the button to set the display panel to 0 .
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ ··· 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

5

Push the On Timer button to set the display panel to 2 .
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ ··· 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

6

Push the Off Timer button to set the display panel to 4 .
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ ··· 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.



✳ Setting is not required if you must 0 a value which has a 0 default.

7 Press Mode button, then the default value is 17 / 00 / 00.

8 Push the ∧ button to set the display panel to 7.
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ · · · 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

9 Push the ∨ button to set the display panel to 0.
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ · · · 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

10 Push the button to set the display panel to 3.
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ · · · 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

11 Push the On Timer button to set the display panel to 6.
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ · · · 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

12 Push the Off Timer button to set the display panel to 0.
Every time you push the button, the display panel reads 0 ➡ 1 ➡ 2 ➡ 3 ➡ · · · 9 ➡ A ➡ b ➡ c ➡ d ➡ E ➡ F repeatedly.

Step 3 : Upon completion of the selection, check you made right selections.

Press the Mode Selection key, Mode to set the display part to 0 and check the display part.

➡ The display part shows 00 / 50 / 24.

Press the Mode Selection key, Mode to set the display part to 1 and check the display part.

➡ The display part shows 17 / 03 / 60.

Step 4 : Press the ON/OFF button ( )

When pressing the operation ON/OFF key with the direction of remote control for unit, the sound "Ding" or "Diriring" is heard and the OPERATION ICON(≋) lamp of the display is flickering at the same time, then the input of option is completed. (If the diriring sound isn't heard, try again pressing the ON/OFF button.)

Step 5 : Unit operation test-run

First, Remove the battery from the remote control.

Second, Re-insert the battery into the remote control.

Third, Press ON/OFF key with the direction of remote control for set.

• Error Mode

1st If all lamps of indoor unit are flickering, Plug out, plug in power plug again and press ON/OFF key to retry.

2nd If the unit is not working properly or all lamps are continuously flickering after setting the option code, see if the correct option code is set up for its model.

6. Troubleshooting

Check the basic items first to judge if the problem was caused by breakdown or misuse. If none of the basic items are related to the problem, please scrutinize the machine according to the 'Breakdown Diagnosis by Symptoms' method.

6-1 Basic Breakdown Diagnosis Items

1. The input voltage should be rating voltage ±10% range.
   The airconditioner may not operate properly if the voltage is out of this range.

2. Is the link cable linking the indoor unit and the outdoor unit linked properly?
   The indoor unit and the outdoor unit shall be linked by 5 cables(Heat pump model) or 3 cables(cool model).
   Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
   Otherwise the airconditioner may not operate properly.

3. When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

No	Operation of air conditioner	Explanation
1	The OPERATION indication LED(GREEN) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate. **[In case of heat pump model]** In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew.
3	Fan speed setting is not allowed in DRY( ) mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY( ) mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Timer LED(GREEN) of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
6	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.
7	**[In case of heat pump model]** Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes (maximum) until the deice is completed.
8	**[In case of heat pump model]** The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
9	**[In case of heat pump model]** Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation

6-2 Trouble check in the initial status

6-2-1 Diagnosis and marking of the part in trouble.

Please check the air conditioner operation status and write the check result in the chart in the room.

Description	LAMP		
	OPERATION	TURBO	TIMER
	≋	TURBO	⏱
Indoor unit room temperature sensor error (open or short)	○	○	◑
Indoor unit heat exchanger temperature sensor error (open or short)	◑	○	◑
Indoor fan motor malfunction	◑	◑	○
EEPROM error	○	◑	◑
Option error (option wasn't set up or option data error)	◑	◑	◑

○ : Lamp off ◑ : Lamp flickering

6-2-2 Operation with abnormal motion

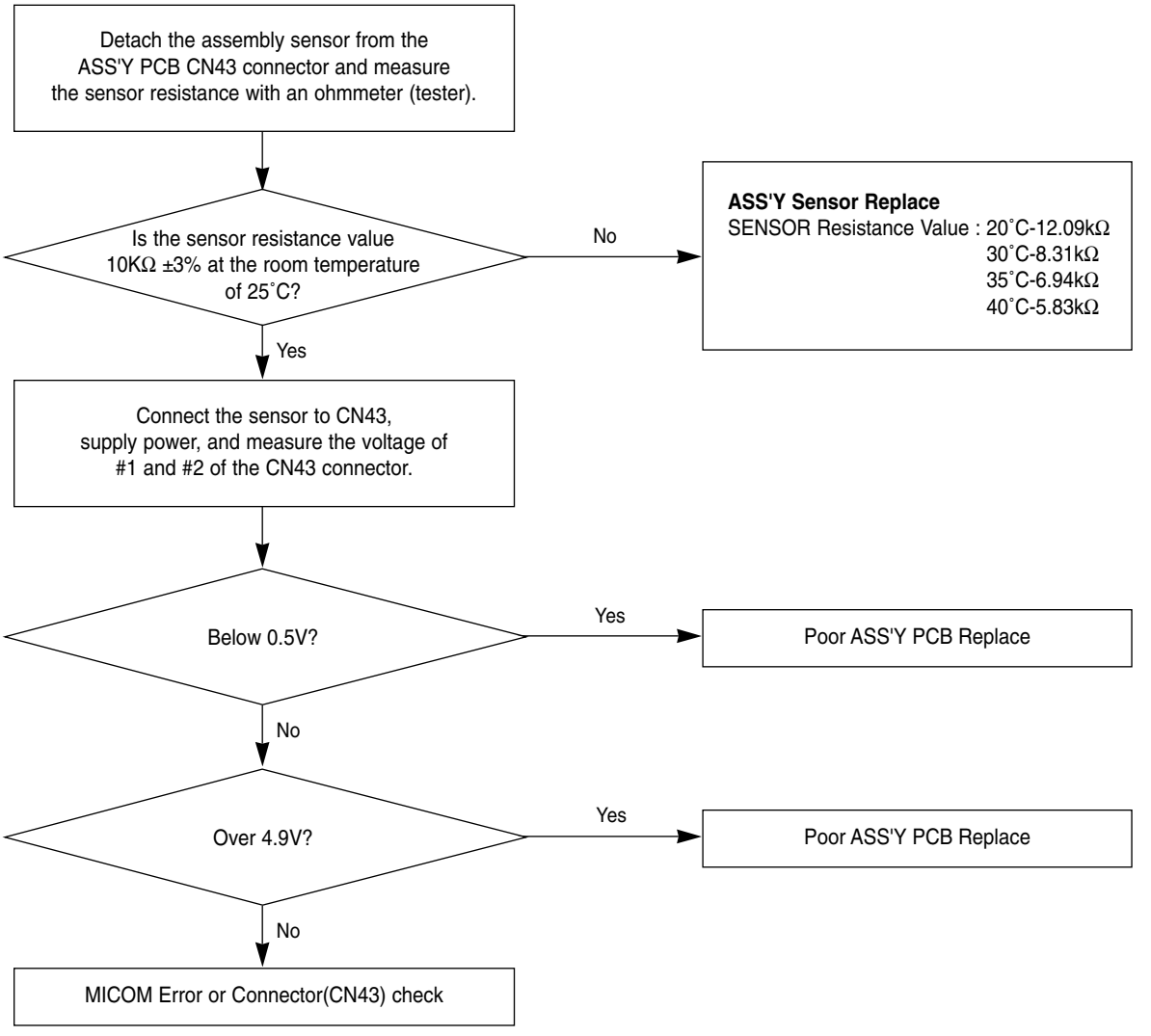
No	Abnormal condition	Inspection		Initial Diagnosis
1	No response from the remote control operation signal.	• Plug out and plug in 5 seconds later.	Able to operate the remote control.	OK
			Unable to operate the remote control.	Press the ⏻ (ON/OFF) button in the indoor unit. • If it operates, the remote control and indoor unit receiver are in trouble. • If not, the indoor unit is in trouble.
2	Unable to operate the outdoor unit	• Press the TURBO button with the remote control. • In 3 minutes, check the voltage between the indoor unit terminal block N(1) and 1.	AC198V ~ AC242V	Problem with the outdoor unit or PCB
			No power source displayed.	Problem with the relay (RY71) or PCB

6-3 Breakdown diagnosis by symptoms

6-3-1 Room temperature sensor failure

Description	LAMP		
	OPERATION	TURBO	TIMER
	≋	TURBO	◷
Indoor unit room temperature sensor error(open or short)	○	○	◑

○ : Lamp off ◑ : Lamp flickering


Detach the assembly sensor from the ASS'Y PCB CN43 connector and measure the sensor resistance with an ohmmeter (tester).
Is the sensor resistance value 10KΩ ±3% at the room temperature of 25˚C?
No
ASS'Y Sensor Replace
SENSOR Resistance Value : 20˚C-12.09kΩ
30˚C-8.31kΩ
35˚C-6.94kΩ
40˚C-5.83kΩ
Yes
Connect the sensor to CN43, supply power, and measure the voltage of #1 and #2 of the CN43 connector.
Below 0.5V?
Yes
Poor ASS'Y PCB Replace
No
Over 4.9V?
Yes
Poor ASS'Y PCB Replace
No
MICOM Error or Connector(CN43) check

6-3-2 Room Pipe sensor failure

Description	LAMP		
	OPERATION	TURBO	TIMER
Indoor unit heat exchanger temperature sensor error (open or short)	◑	○	◑

○ : Lamp off ◑ : Lamp flickering

1. Check the assembly condition of the sensor connector(CN43) on the indoor unit Main PCB and if not assembled, reassemble the connector accurately.

2. Detach the room pipe sensor connector(CN43) and check the resistance between connector 3 and 4.

Temperature(˚C)	Resistance Value(Kohm)	Temperature(˚C)	Resistance Value(Kohm)	Others
15	14.68	30	8.31	The data tolerance is ±3%.
20	12.09	35	6.94	
25	10	40	5.83	

   If the above data is not met, replace the room pipe sensor.

3. Assemble the room pipe sensor to PCB, plug in, and check the voltage of connector 3 and 4. If the resistance is below 0.5V or over 4.9V, replace the indoor Main PCB. (short or disconnected in the PCB board)

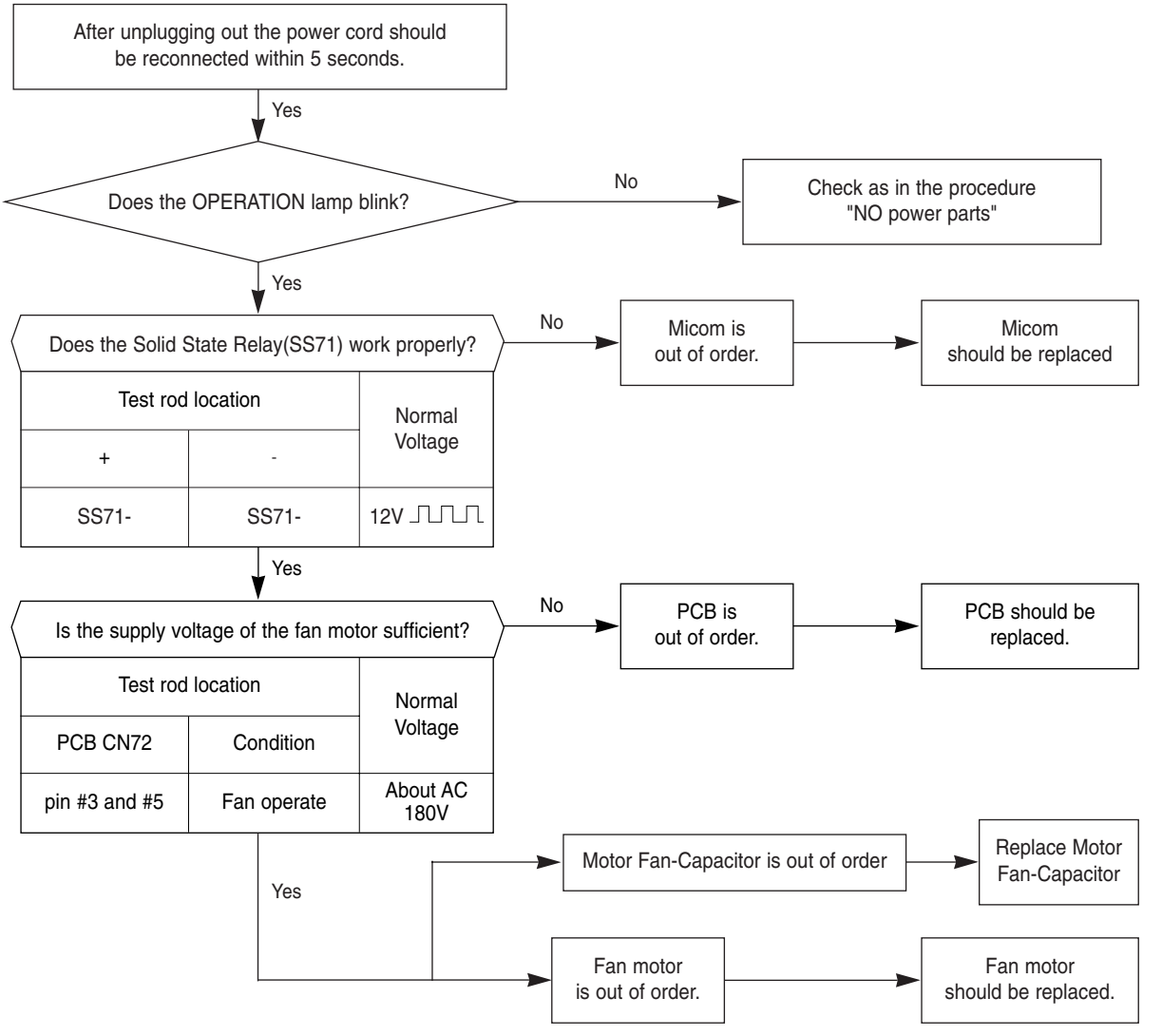
6-3-3 When the Indoor unit fan motor doesn't operate

Description	LAMP		
	OPERATION	TURBO	TIMER
Indoor fan motor malfunction	◑	◑	○

○ : Lamp off ◑ : Lamp flickering

1. Checklist :
   1) Is the indoor unit fan motor properly connected with the connector (CN72)?
   2) Is the AC voltage correct?
   3) Is HALL IC in indoor fan motor properly connected with the connector (CN44)?
   4) Is the running capacitor (CR71) properly connected with PCB board?

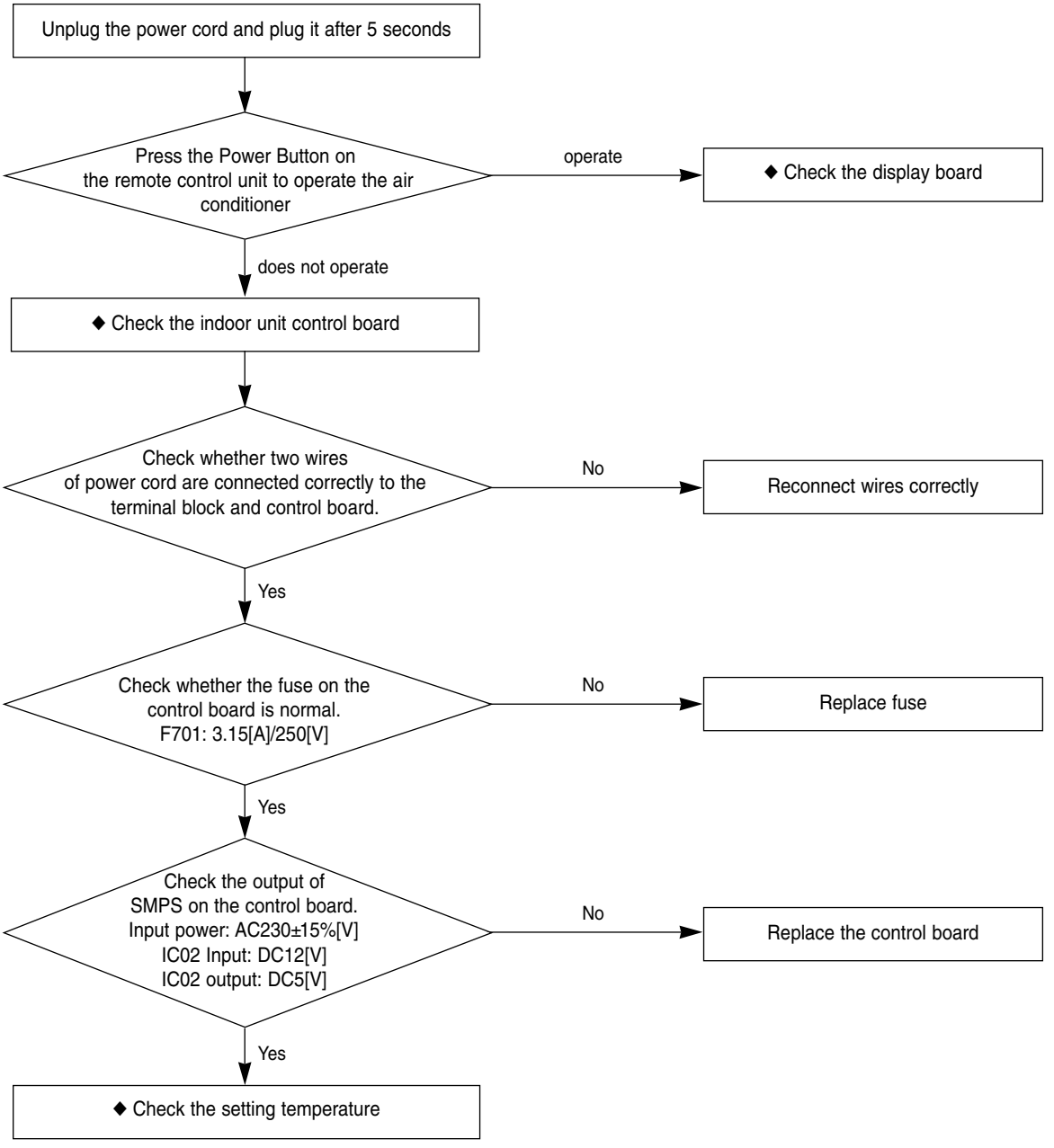
2. Troubleshooting procedure



6-3-4 When the power doesn't come in.

1. Checklist :
   1) Is input voltage normal?
   2) Is AC power linked correctly?
   3) Is input voltage of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
   4) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)

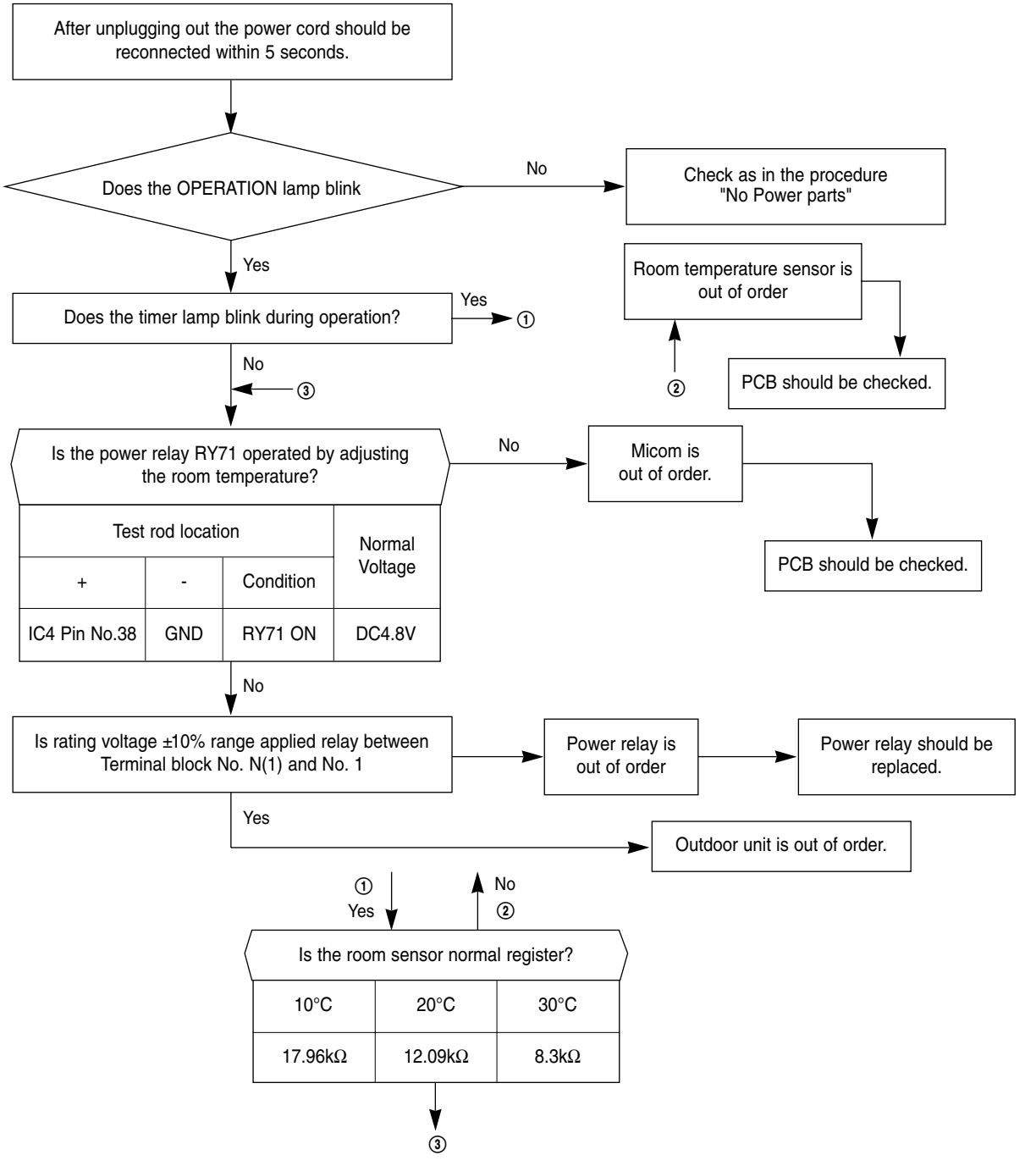
2. Troubleshooting procedure


Unplug the power cord and plug it after 5 seconds
Press the Power Button on the remote control unit to operate the air conditioner
operate
◆ Check the display board
does not operate
◆ Check the indoor unit control board
Check whether two wires of power cord are connected correctly to the terminal block and control board.
No
Reconnect wires correctly
Yes
Check whether the fuse on the control board is normal. F701: 3.15[A]/250[V]
No
Replace fuse
Yes
Check the output of SMPS on the control board. Input power: AC230±15%[V] IC02 Input: DC12[V] IC02 output: DC5[V]
No
Replace the control board
Yes
◆ Check the setting temperature

6-3-5 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

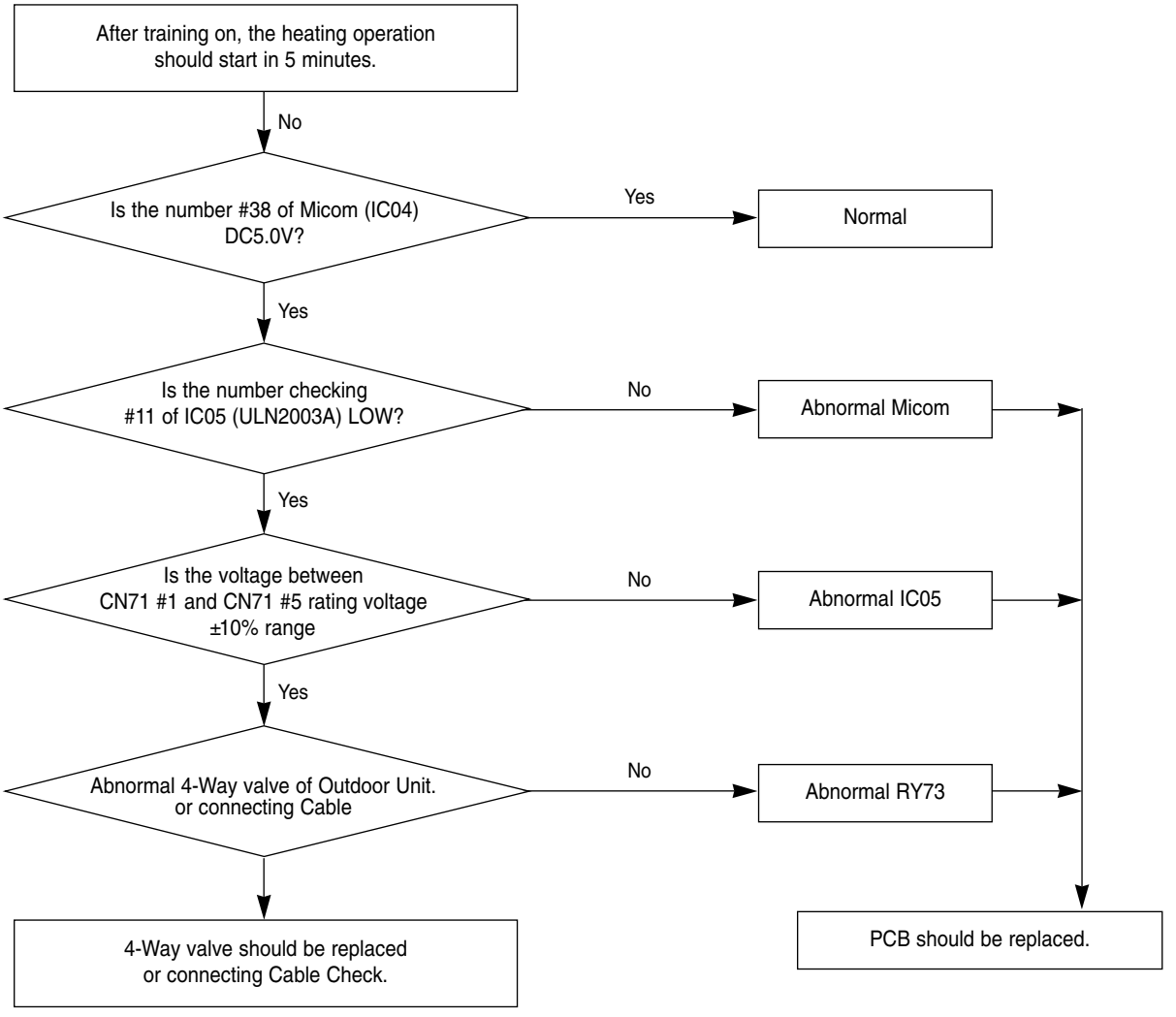
1. Checklist :
   1) Is input voltage normal?
   2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
   4) Is the POWER IN connector (CN71) linked correctly?
   5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(N(1), 1, 2, 3)?

2. Troubleshooting procedure



6-3-6 In the HEAT mode, When there is no warm air current. Check this fist;

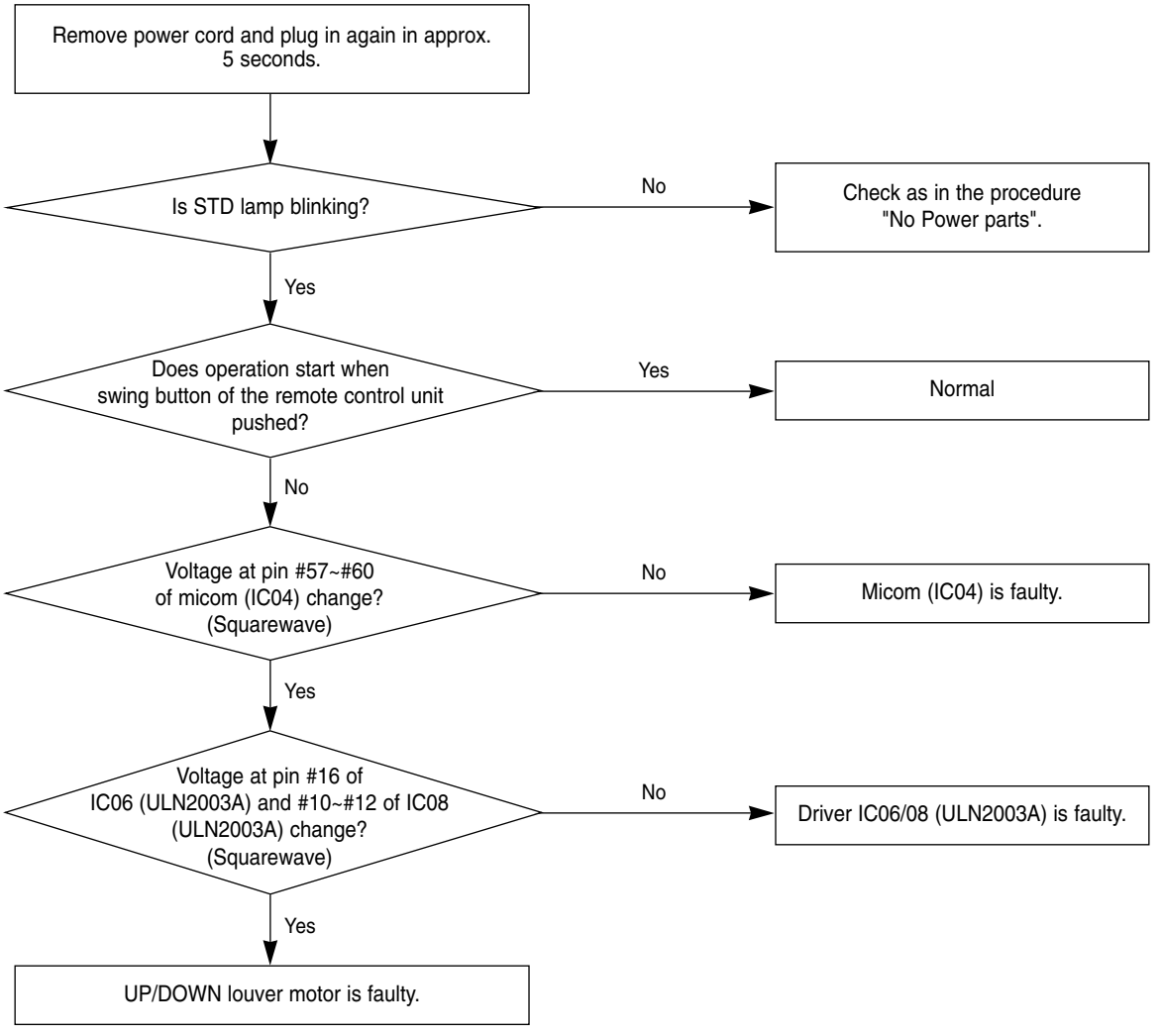
1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
2) Is the Indoor PCB properly connected with the CN71 connector?


After training on, the heating operation should start in 5 minutes.
No
Is the number #38 of Micom (IC04) DC5.0V?
Yes
Normal
Yes
Is the number checking #11 of IC05 (ULN2003A) LOW?
No
Abnormal Micom
Yes
Is the voltage between CN71 #1 and CN71 #5 rating voltage ±10% range
No
Abnormal IC05
Yes
Abnormal 4-Way valve of Outdoor Unit. or connecting Cable
No
Abnormal RY73
4-Way valve should be replaced or connecting Cable Check.
PCB should be replaced.

6-3-7 When the UP/DOWN Louver Motor Does Not Operate. (Initial Diagnosis)

1. Checklist :
   1) Is input voltage normal?
   2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?

2. Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is STD lamp blinking?
No
Check as in the procedure "No Power parts".
Yes
Does operation start when swing button of the remote control unit pushed?
Yes
Normal
No
Voltage at pin #57~#60 of micom (IC04) change? (Squarewave)
No
Micom (IC04) is faulty.
Yes
Voltage at pin #16 of IC06 (ULN2003A) and #10~#12 of IC08 (ULN2003A) change? (Squarewave)
No
Driver IC06/08 (ULN2003A) is faulty.
Yes
UP/DOWN louver motor is faulty.

6-3-8 When the remote control is not receiving.

1. Check if the connector was normally assembled.

2. Put the set in operation and check the voltage of No. 3(+) and No. 2(-) of the main PCB CN91 while operating the remote control. When the voltage descends below 3V, the assembly module PCB is normal and the main PCB is poor. Then replace the main PCB.

3. Replace the assembly display PCB because the module PCB is poor if the voltage between No. 2~3 of CN91 maintains 5V after the remote control starts operation.

6-4 PCB Inspection Method

6-4-1 Pre-inspection Notices

1. Check if you pulled out the AC power plug when you eliminate the PCB or front panel.
2. Don't hold the PCB side not impose excessive force on it to eliminate the PCB.
3. Don't pull the lead wire but hold the whole housing to connect or disconnect a connector to the PCB.

6-4-2 Inspection Procedure

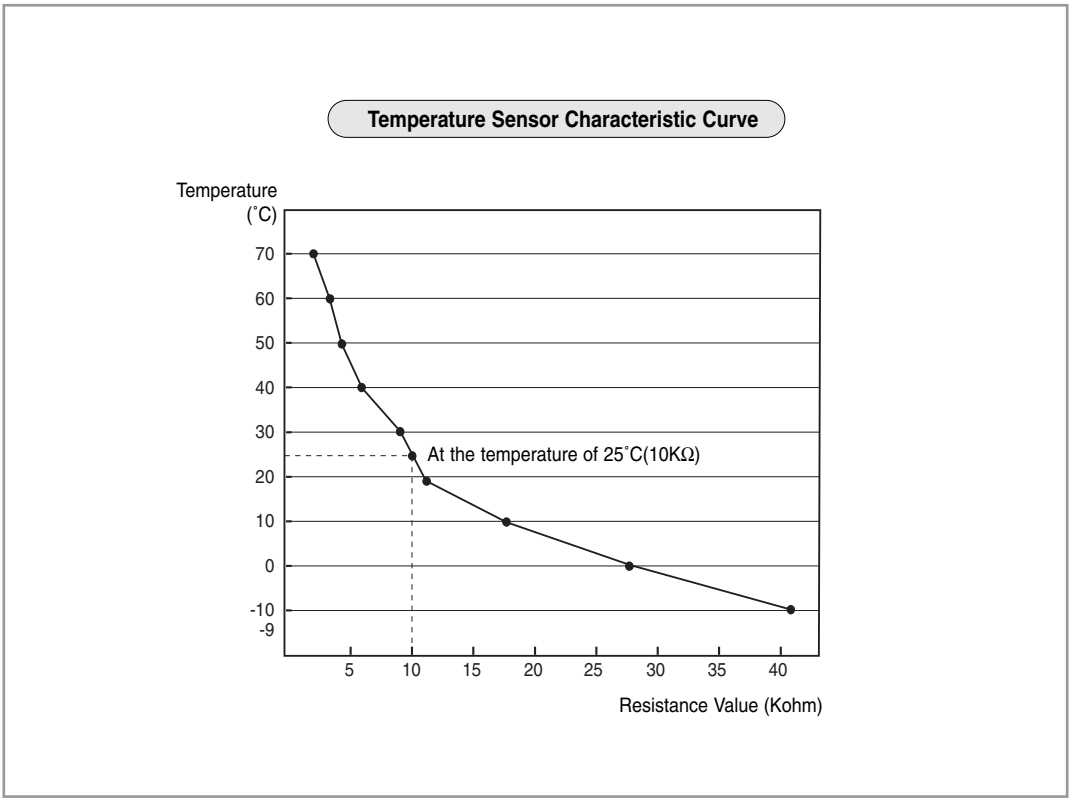
1. Check connector connection and peeling of PCB or bronze coating pattern when you think the PCB is broken.
2. The PCB is composed of the 3 parts.
   - **Main PCB Part** : MICOM and surrounding circuit, relay, room fan motor driving circuit and control circuit, sensor driving circuit, power circuit of DC12V and DC5V, and buzzer driving circuit.
   - **Display part** : LED lamp
   - **Switch part** : Switch

6-4-3 Detailed Inspection Procedure

No	Procedure	Inspection Method	Cause
1	Plug out and pull the PCB out of the electronic box. Check the PCB fuse.	1) Is the fuse disconnected? (F701)	• Overcurrent • Indoor Fan Motor Short • AC Part Pattern Short of the MAIN PCB
2	Supply power. If the operating lamp twinkles at this time, the above 1)~3) have no relation.	Checking the power voltage.	
		1) Is the DB71input voltage AC200V~AC240V?	• Power Cord is fault, Fuse open. Wrong Power Cable Wiring, AC Part is faulty.
		2) Is the voltage between both terminals of the C102 on the 2nd side of the transformer AC12V ±0.5V?	• Switching Trans or Power Circuit is faulty
		3) Is the voltage between both terminals of OUT and GND of IC02(KA78L05) DC5V ±0.5V?	• Power Circuit is faulty, Load Short
3	Press the ON/OFF button and operate TURBO mode. But, exclude the RESERVE operation.	Checking the power voltage.	
		1) Check the voltage of the relay(RY71) coil(IC05 PIN #11 and GND : 0V, PIN#6 and GND : 5V) during operation(3 minutes after TURBO operation).	• Relay(RY71) Coil Disconnection, IC05 is faulty
		2) Check the voltage of both terminals of terminal block 1 and N(1) after 3 minute operation.: AC220V	• Relay(RY71) Contact is faulty
4	Press the ON/OFF button. 1. FAN Speed [High] 2. Continuous Operation	1) Is the voltage over AC180V being imposed on terminal #3 and #5 of the fan motor connector(CN72)?	• Fan Motor of the indoor is faulty
		2) The fan motor of the indoor unit doesn't run.	• Fan Motor Connector(CN72) is faulty
		3) The power voltage between terminal #3 and #5 of the connector(CN72) is 0V.	• ASS'Y Main PCB is faulty • Connection is faulty

6-4-4 Temperature Sensor Feature Conversion Table(Room Temperature Sensor); 103AT

Temperature [˚C]	Sensor Resistance [Kohm]	Temperature [˚C]	Sensor Resistance [Kohm]	Temperature [˚C]	Sensor Resistance [Kohm]	Temperature [˚C]	Sensor Resistance [Kohm]
70	2.229						
69	2.296	49	4.300	29	8.622	9	18.700
68	2.365	48	4.444	28	8.944	8	19.480
67	2.437	47	4.594	27	9.281	7	20.290
66	2.512	46	4.749	26	9.632	6	21.150
65	2.589	45	4.912	25	10	5	22.050
64	2.669	44	5.080	24	10.380	4	22.990
63	2.752	43	5.256	23	10.780	3	23.900
62	2.838	42	5.439	22	11.200	2	25.030
61	2.928	41	5.630	21	11.630	1	26.130
60	3.021	40	5.828	20	12.090	0	27.280
59	3.116	39	6.033	19	12.560	-1	28.470
58	3.216	38	6.246	18	13.060	-2	29.720
57	3.319	37	6.468	17	13.570	-3	31.040
56	3.426	36	6.699	16	14.120	-4	32.430
55	3.537	35	6.941	15	14.680	-5	33.890
54	3.652	34	7.192	14	15.280	-6	35.430
53	3.772	33	7.455	13	15.900	-7	37.050
52	3.897	32	7.729	12	16.550	-8	38.760
51	4.026	31	8.015	11	17.240	-9	40.560
50	4.161	30	8.313	10	17.960		



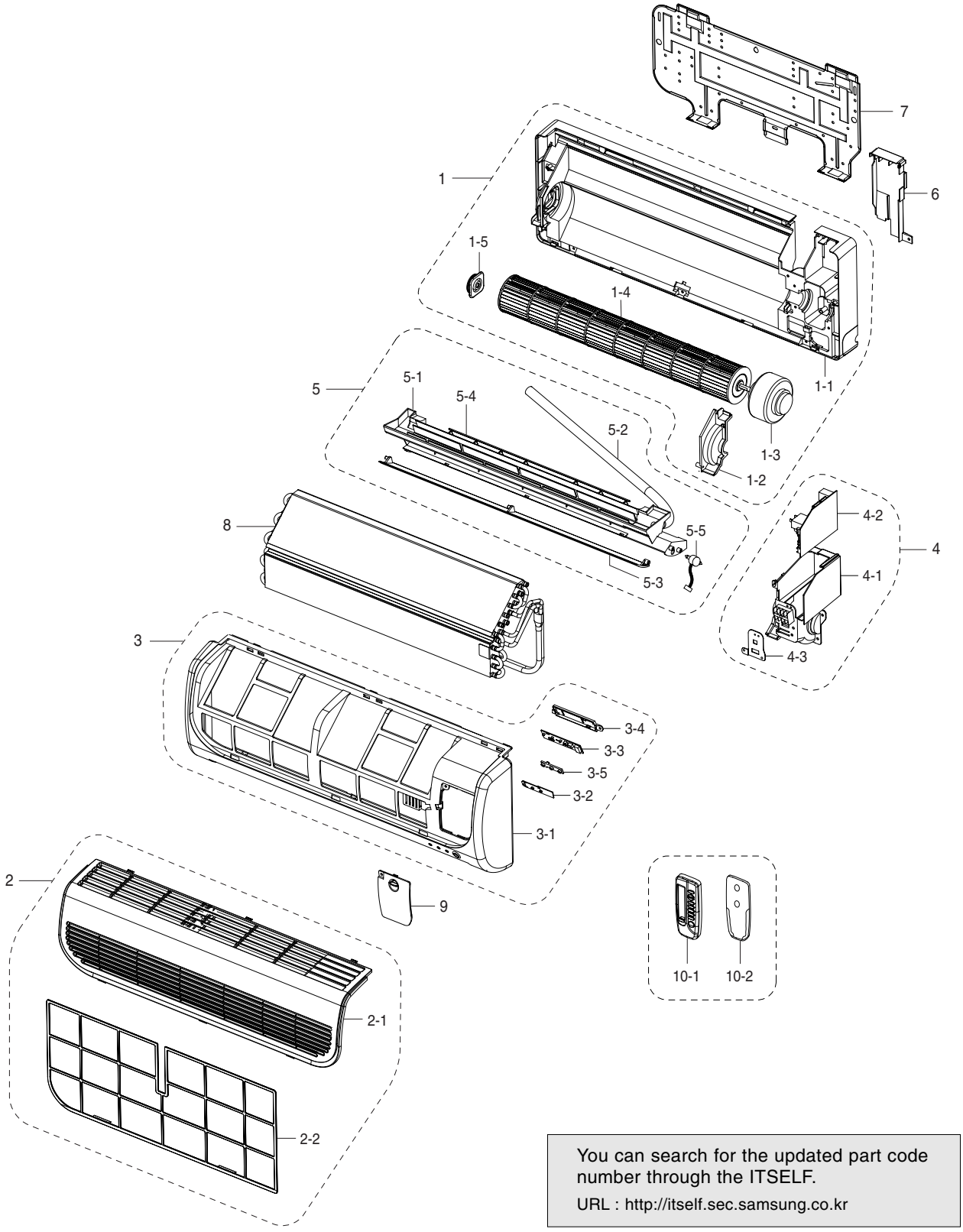
6-5 Main Part Inspection Method

<table>
<tr><th>Part</th><th colspan="2">Breakdown Inspection Method</th></tr>
<tr><td rowspan="3">Room Temperature Sensor</td><td colspan="2">Measure resistance with a tester</td></tr>
<tr><td>Normal</td><td>At the normal temperature 37kΩ~ 8.3kΩ(-7˚C~+30˚C) *Refer to Table 6-4-4.</td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω · · · Open or Short</td></tr>
<tr><td rowspan="3">Room Fan Motor</td><td colspan="2">Measure the resistance between terminals of the connector (CN73) with a tester.</td></tr>
<tr><td>Normal</td><td>At the normal temperature (10˚C ~ 30˚C)
<table>
<tr><th>Compare terminal</th><th>Resistance</th><th>Remark</th></tr>
<tr><td>Yellow, Blue</td><td>404.4Ω ± 10%</td><td>Main</td></tr>
<tr><td>Yellow, Red</td><td>340Ω ± 10%</td><td>Sub</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω · · · Open or Short</td></tr>
<tr><td rowspan="3">Outdoor Fan Motor</td><td colspan="2">Measure the resistance between motor wires with a tester.</td></tr>
<tr><td>Normal</td><td>At the normal temperature (10˚C ~ 30˚C)
<table>
<tr><th>Compare terminal</th><th>Resistance</th><th>Remark</th></tr>
<tr><td>Yellow, Red</td><td>360Ω ± 10%</td><td>Main</td></tr>
<tr><td>Black, Yellow</td><td>328Ω ± 10%</td><td>Sub</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω · · · Open or Short</td></tr>
<tr><td rowspan="3">Stepping Motor
(Discharge Air flow blade : B/L/R)</td><td colspan="2">Measure the resistance between the red wire and each terminal wire with a tester.</td></tr>
<tr><td>Normal</td><td>About 300Ω at the normal temperature (20˚C ~ 30˚C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω · · · Open or Short</td></tr>
<tr><td rowspan="3">Stepping Motor
(Grille Motor)</td><td colspan="2">Measure the resistance between connector 3 and each terminal wire with a tester.</td></tr>
<tr><td>Normal</td><td>About 120Ω at the normal temperature (20˚C ~ 30˚C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω · · · Open or Short</td></tr>
</table>

MEMO

7. Exploded Views and Parts List

7-1 Indoor Unit



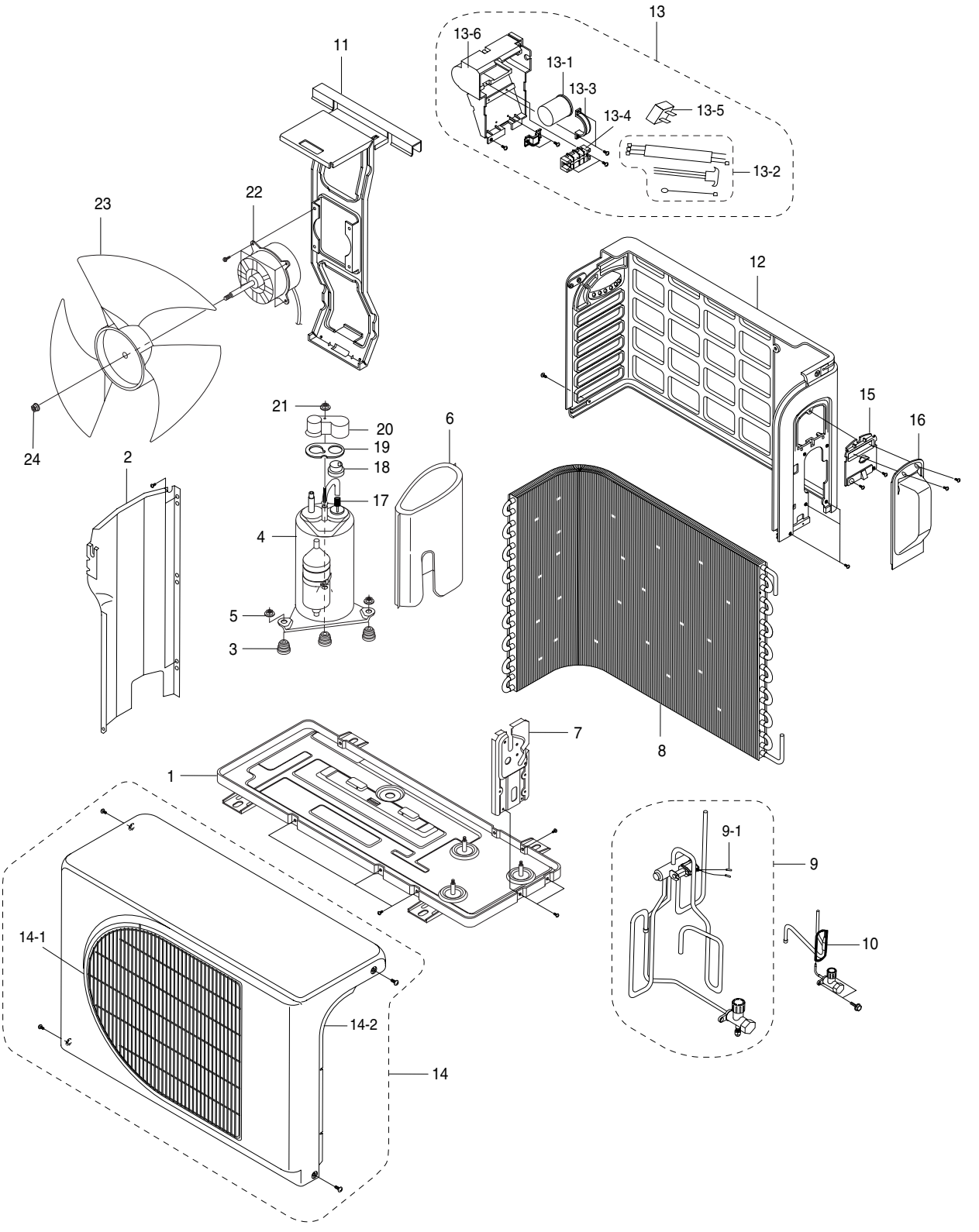
You can search for the updated part code number through the ITSELF.

URL : http://itself.sec.samsung.co.kr

■ **Parts List**

No.	Code No.	Description	Specification	Q'TY
1	DB94-00434A	ASS'Y BACK BODY	ASS'Y	1
1-1	DB61-01660A	BACK BODY	HIPS	1
1-2	DB61-01655A	HOLDER MOTOR	PP(V0)	1
1-3	DB31-00217A	MOTOR FAN IN	ASS'Y	1
1-4	DB94-00436A	CROSS FAN	ASS'Y	1
1-5	DB94-00258A	RUBBER BEARING	RUBBER	1
2	DB92-00527B	ASS'Y GRILLE	ASS'Y	1
2-1	DB64-01005A	GRILLE AIR INLET	HIPS	1
2-2	DB63-00870B	GUARD AIR FILTER	PP	1
3	DB92-00528A	ASS'Y PANEL FRONT	ASS'Y	1
3-1	DB64-01004A	PANEL FRONT	HIPS	1
3-2	DB63-00866A	COVER DISPLAY	PC	1
3-3	DB93-02534A	ASS'Y DISPLAY PCB	ASS'Y	1
3-4	DB63-00865A	COVER DISPLAY PCB	HIPS	1
3-5	DB61-01657A	HOLDER LED	HIPS	1
4	DB93-02513D	ASS'Y CONTROL IN	ASS'Y	1
4-1	DB61-01656A	HOLDER CONTROL	HIPS(V0)	1
4-2	DB93-02617A	ASS'Y MAIN PCB	ASS'Y	1
4-3	DB62-01661A	HOLDER CLAMP IN	SGCC-M	1
5	DB94-00314A	ASS'Y TRAY DRAIN	ASS'Y	1
5-1	DB63-00869A	TRAY DRAIN	ABS	1
5-2	DB94-00551A	DRAIN HOSE	ASS'Y	1
5-3	DB66-00606A	BLADE-H	HIPS	1
5-4	DB66-00605A	BLADE-V	PP	1
5-5	DB95-20138A	MOTOR STEPPING	ASS'Y	1
6	DB61-01658A	HOLDER PIPE	HIPS	1
7	DB70-00426A	PLATE HANGER	SGCC-M	1
8	DB96-03063D	ASS'Y EVAP UNIT	ASS'Y	1
9	DB63-00867A	COVER TERMINAL	HIPS(V0)	1
10-1	DB93-01364B	REMOCON	ASS'Y	1
10-2	DB61-00204A	REMOCON HOLDER	HIPS	1

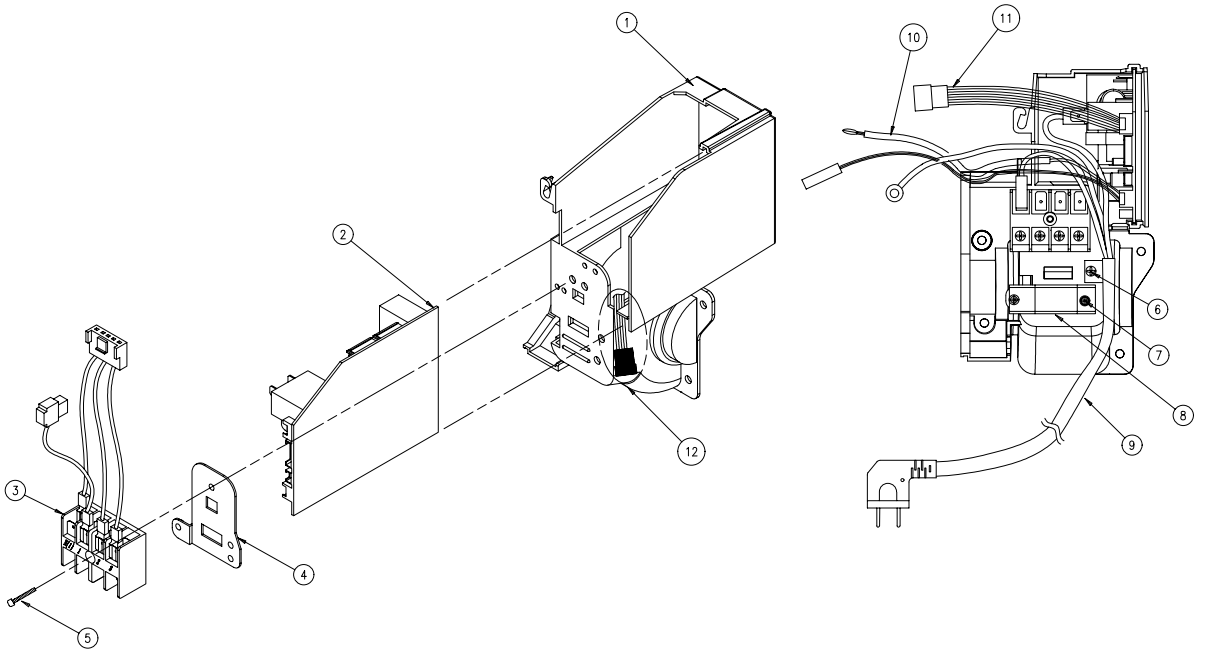
7-2 Outdoor Unit



■ **Parts List**

No.	Code No.	Description	Q'TY
1	DB90-00107D	ASS'Y BASE OUT	1
2	DB94-00045A	ASS'Y PARTITION	1
3	DB73-00070A	GROMMET ISOLATOR	3
4	G4A080JU1EP-TS	ROTARY COMP	1
5	DB60-30028A	NUT WASHER	1
6	DB72-00727A	CLOTH COMP SOUND	1
7	DB61-00168A	BRACKET VALVE	1
8	DB96-03064D	ASS'Y CONDENSER	1
9	DB99-00574A	ASS'Y 4WAY VALVE	1
9-1	DB33-00002A	ASS'Y SOLENOID COIL	1
10	DB96-02989F	ASS'Y TUBE CAPILLARY	1
11	DB90-01287A	ASS'Y BRACKET MOTOR	1
12	DB90-00109D	ASS'Y CABI SIDE	1
13	DB93-02565C	ASS'Y CONTROL OUT	1
13-1	2501-001236	C OIL	1
13-2	DB93-00481A	ASS'Y LEAD WIRE	1
13-3	DB61-00172A	HOLDER CAPACITOR	1
13-4	DB65-40049E	TERMINAL BLOCK	1
13-5	2301-001375	C FILM	1
13-6	DB61-00170A	CASE CONTROL OUT	1
14	DB90-00108J	ASS'Y CABI FRONT	1
14-1	DB63-00099A	GUARD FAN WIRE	1
14-2	DB64-00086A	CABINET FRONT	1
15	DB90-00152A	ASS'Y COVER CONTROL	1
16	DB94-00021A	ASS'Y COVER VALVE	1
17	DB67-60020A	SPRING OLP	1
18	DB35-00028V	PROTECTOR O/P	1
19	DB63-20002A	GASKET	1
20	DB63-10165D	COVER TERMINAL	1
21	DB60-30018A	NUT FLANGE	1
22	DB31-00034A	MOTOR FAN OUT	1
23	DB67-00036A	FAN PROPELLER	1
24	DB60-30020A	NUT FLANGE	1

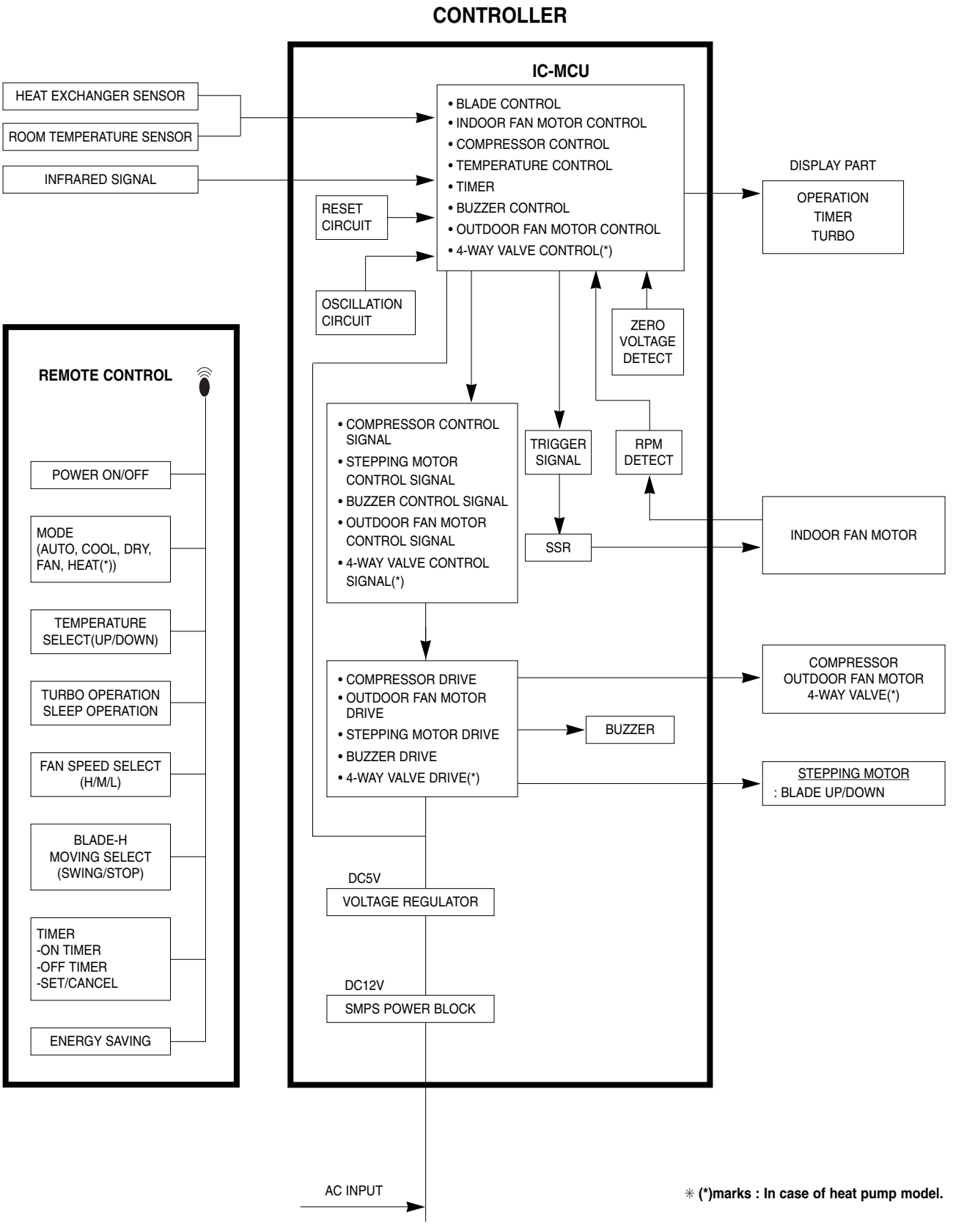
7-3 Ass'y-Control In : DB93-02513D



■ **Parts List**

No.	Code No.	Description	Specification	Q'TY
1	DB61-01656A	CASE-CONTROL	HIPS	1
2	DB93-02617A	ASS'Y MAIN PCB	ASS'Y	1
3	DB93-02508A	ASS'Y TERMINAL BLOCK	ASS'Y	1
4	DB61-01661A	HOLDER CLAMP IN	SGCC-M T1.0	1
5	6001-000929	SCREW-MACHINE	PH M3xL22	1
6	6001-001054	SCREW-MACHINE	TH M4xL10	1
7	6001-000725	SCREW-MACHINE	TH M4xL16	2
8	DB61-00171A	CLAMP WIRE	ABS	1
9	DB93-01549B	POWER CORD	-	1
10	DB32-00020A	ASS'Y-THERMISTOR	ASS'Y	1
11	DB93-02498A	ASS'Y-C/W SUB(MAIN)	ASS'Y	1
12	DB39-00147D	CONNECTOR PCB U/D	ASS'Y	1

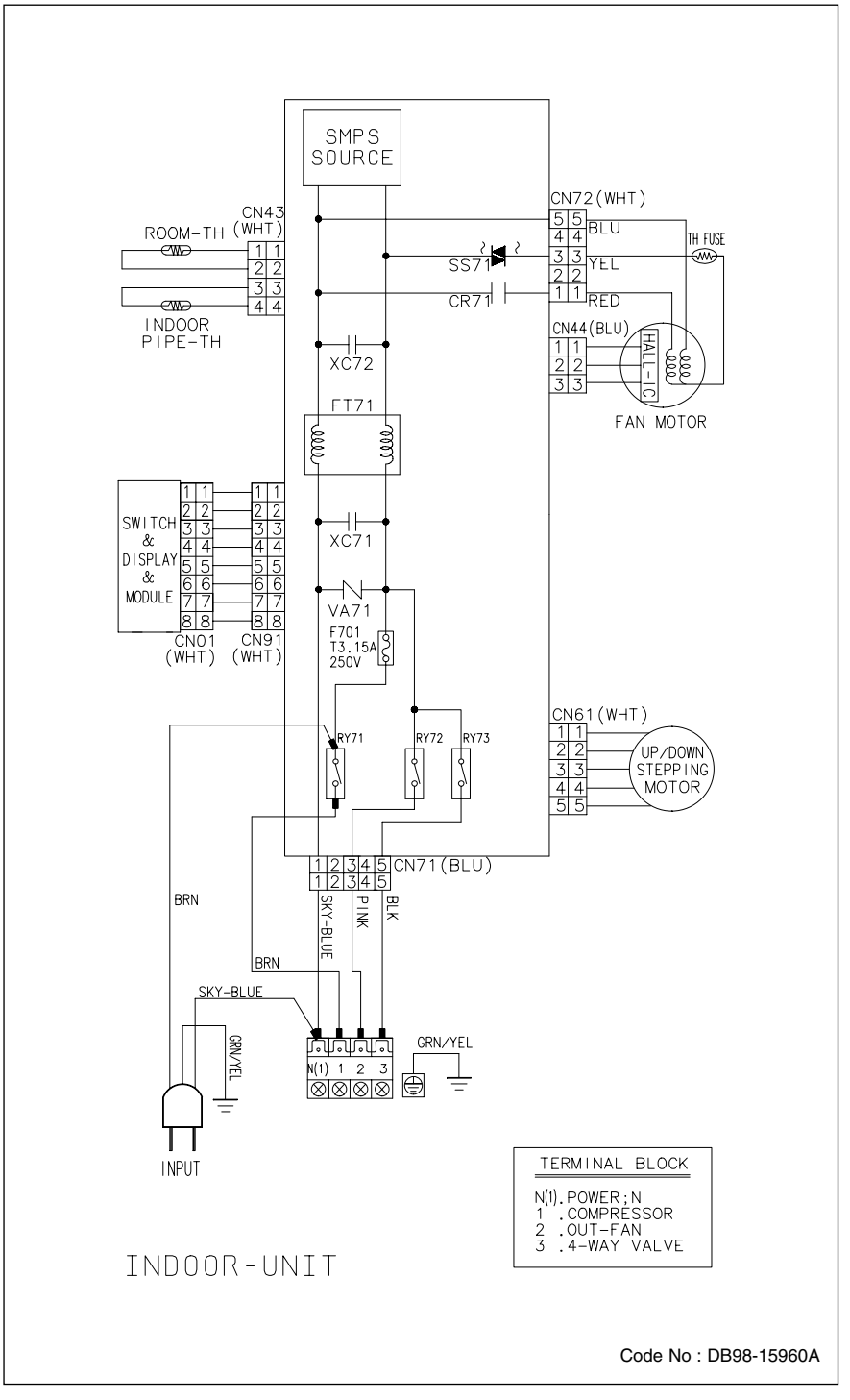
8. Block Diagram



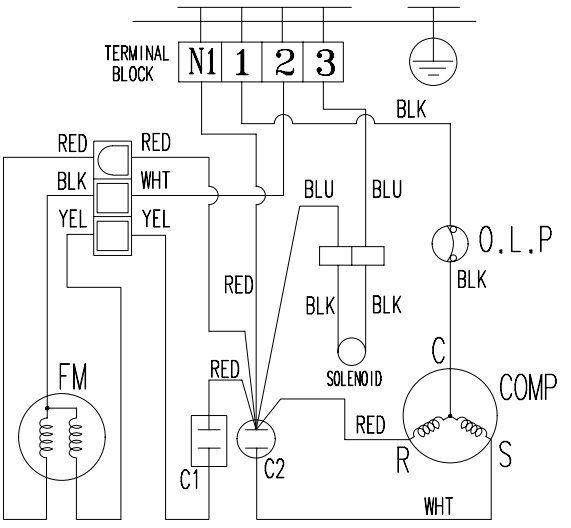
✳ **(*)marks : In case of heat pump model.**

9. Wiring Diagram

9-1 Indoor Unit



This Document can not be used without Samsung's authorization.



C1 : MOTOR CAPACITOR
C2 : COMP CAPACITOR

Code No : DB68-01765A

This Document can not be used without Samsung's authorization.

MEMO

This Service Manual is a property of Samsung Electronics Co., Ltd.
Any unauthorized use of Manual can be punished under applicable
International and/or domestic law.

© Samsung Electronics Co., Ltd. Jan. 2005.
Printed in Korea.
Code No. DB98-21337A(1)